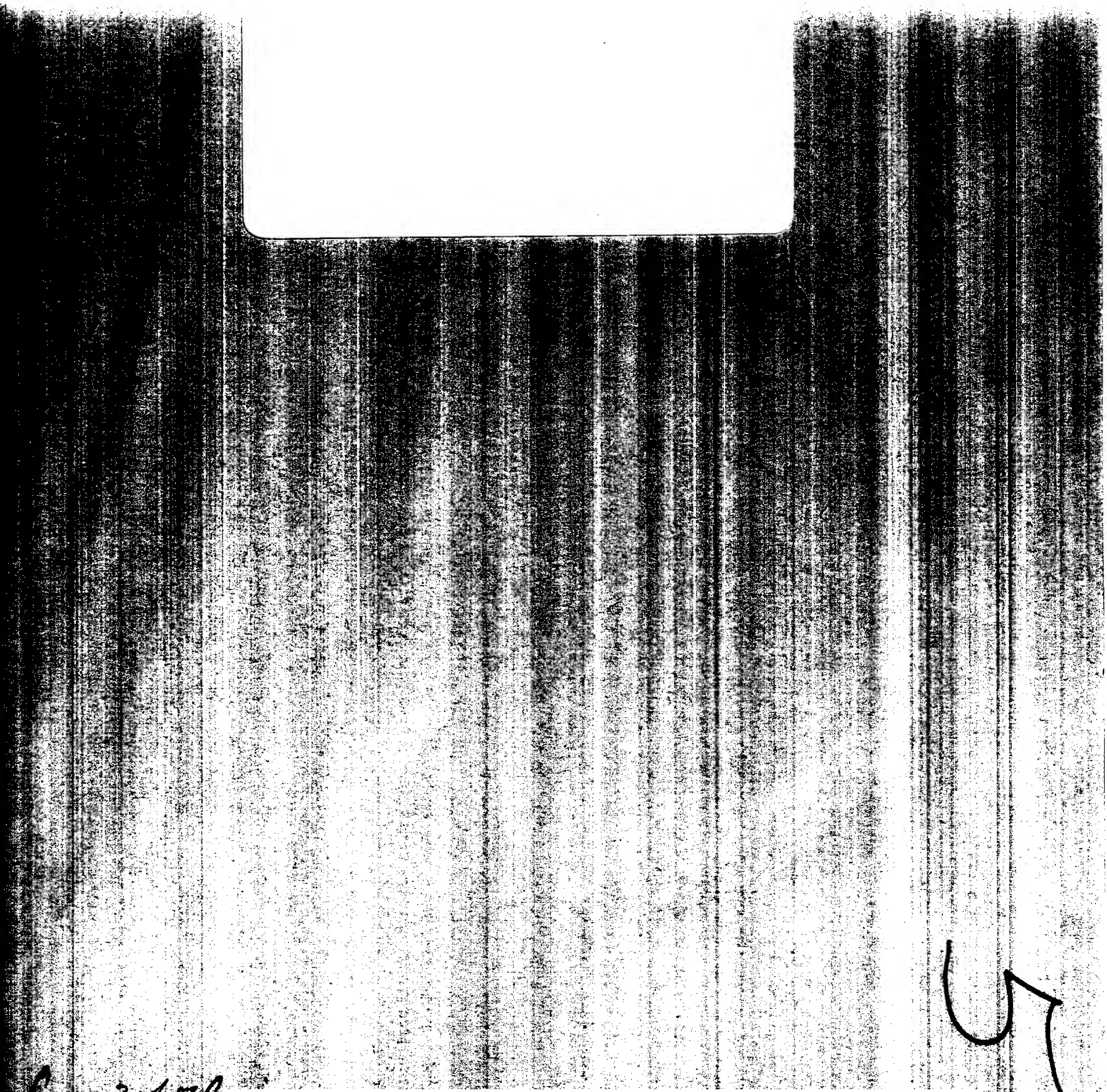
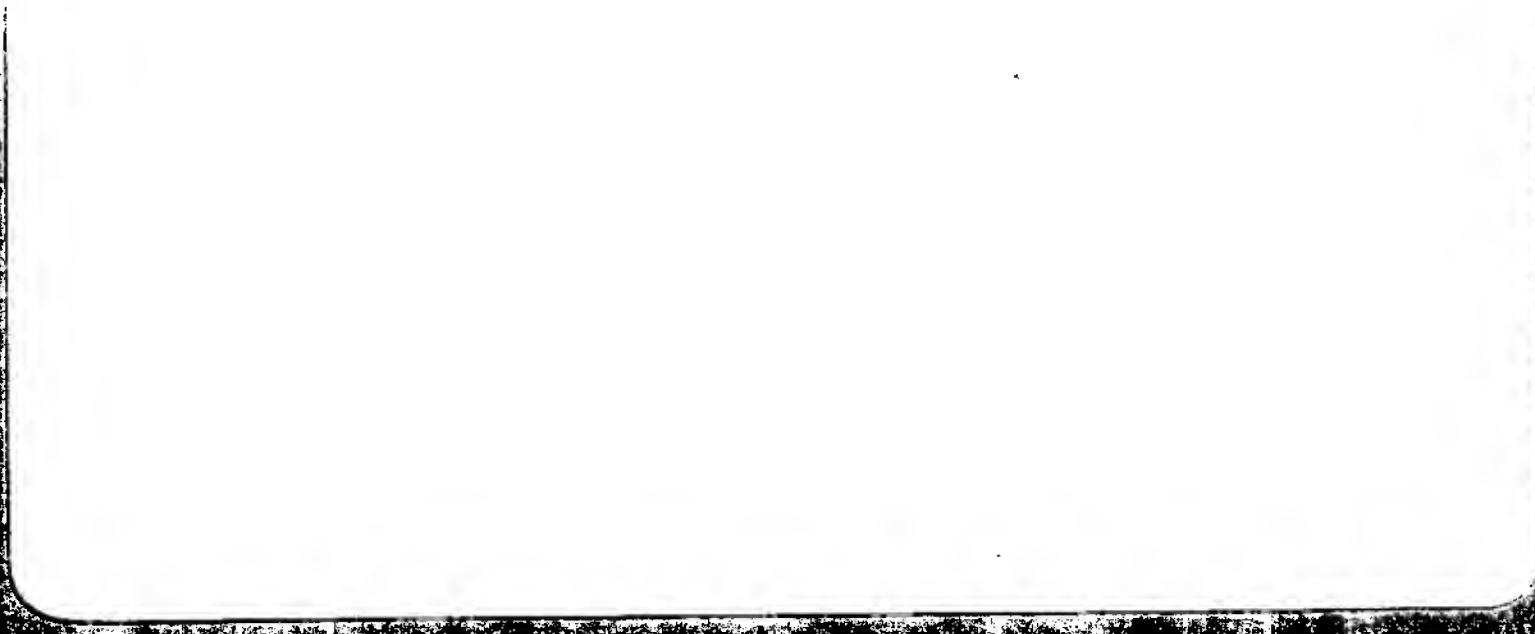


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25 YEAR RE-REVIEW

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Cost Estimate
for
"Project Moonshine"

Document # 111

February 10, 1960

Prepared by:

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Reviewed by:

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The purpose of this document is to present a revised cost estimate for "Project Moonshine", in order to accommodate certain re-appraisals which have occurred since the publication of document # 84, "Proposal for Project Moonshine", December 5th, 1959.

The changes in estimated costs are essentially the reflection of seven considerations. These are:

1. Optical Fabrication

Our manufacturing facility has produced a detailed cost estimate for the 18 f/3.8 Baker Schmidt system. This estimate may be considered as much more accurate than the previous one reported in Document #84 in that the earlier one was based on only qualitative descriptions of possible systems of a variety of over all sizes.

2. Window Materials

This cost estimate reflects the possibility of a satisfactory window consisting of only a single piece of quartz. While experiments are now in progress to establish what will be acceptable the facts are not yet known. We here propose that if it proves necessary to provide a more complex window this will constitute a change in scope.

3. Spares

This proposal includes the costs of all engineering, fabrication, component tests, assembly tests and system tests in plant, in test vehicles and in the article.

It does not include more spares than are now estimated as required for the flight test program nor does it include any support of flight operations after engineering tests are complete.

4. Maintenance and Overhaul (In-Plant)

In-plant maintenance and overhaul will be confined to support of systems during their flight test phase, prior to customer acceptance. There is no consideration for maintenance and overhaul or product improvement as part of "operational" support.

This has resulted in a reduction of estimated costs.

5. Flight Test Program (Site)

The flight test program will be confined to support of systems during their flight test phase, prior to customer acceptance.

What at Site?

There is no consideration for "operational" support at the site.

This has resulted in a reduction of estimated costs.

6. Reliability

Re-estimates from sub-contractors regarding a parallel V/h sensor program and vibration consulting services, coupled with the assumption that certain "test-bed" facilities will be customer furnished, has resulted in a reduction of estimated costs.

What Req?

7. Costs

Continued engineering establishes the requirement for more accurate gyros for stabilization. This has resulted in an increase of estimated costs for this area.

This cost estimate is divided into six sections, as follows:

1. Prototype
2. Field Support Equipment
3. Spare Parts
4. Flight Test Program
5. Five Additional Systems (2-6)
6. Nine Additional Systems (2-10)

1. Estimated Costs for Prototype**(Reference Document # 84 for Descriptions of Activities)**

| | | |
|---|----|------------------|
| A. Project Direction (21 months) | \$ | 110,817.00 |
| B. Project Control (21 months) | \$ | 192,162.00 |
| C. Creative Engineering (Excluding Windows) | | |
| 1. Engineering | \$ | 1,089,000. |
| 2. Purchases | \$ | 100,000. |
| 3. Fabrication | \$ | 60,000. |
| 4. Travel | \$ | <u>40,000.</u> |
| | | \$ 1,289,000.00 |
| D. Reliability | | |
| 1. Engineering | \$ | 180,000. |
| 2. Fabrication | \$ | 119,000. |
| 3. Sub-Contracts | | |
| a. Vibration | \$ | 100,000. |
| b. V/H Sensor | \$ | 40,000. |
| c. Environmental Tests | \$ | <u>20,000.</u> |
| | \$ | 160,000. |
| 4. Travel | \$ | <u>3,000.</u> |
| | | \$ 462,000.00 |
| E. Hardware (Excluding Windows) | | |
| 1. Glass | | |
| a. Material | \$ | 29,000. |
| b. Fabrication | \$ | 28,000. |
| c. Tooling | \$ | <u>70,000. *</u> |
| | \$ | 127,000. |
| 2. Metal | | |
| a. Material | \$ | 6,000. |
| b. Fabrication | \$ | 60,000. |
| c. Sub-Contract | \$ | 90,000. |
| d. Tooling | \$ | <u>27,000.</u> |
| | \$ | 183,000. |

| | |
|--------------------|------------------|
| 3. Purchases | \$ 60,000. |
| 4. Quality Control | \$ 16,300. |
| 5. Travel | <u>\$ 8,000.</u> |

\$ 394,300.00

F. Windows

| | |
|------------------|------------------|
| 1. Development | |
| a. Engineering | \$ 160,000. |
| b. Fabrication | \$ 10,000. |
| c. Purchases | \$ 28,000. |
| d. Sub-contracts | \$ 15,000. |
| e. Travel | <u>\$ 7,000.</u> |
| | \$ 220,000. |

| | |
|--------------------|---------------------|
| 2. Manufacturing | |
| a. Material | \$ 29,000. |
| b. Fabrication | \$ 24,000. |
| c. Quality Control | \$ 1,200. |
| d. Tooling | <u>\$ 10,000. *</u> |
| | <u>\$ 64,200.</u> |

\$ 284,200.00

* See Attachment "A" for Capital Equipment Req'd. in addition to this tooling.

2. Estimated Costs for Field Support Equipment

(Reference Document # 84 for Description of Equipment)

| | |
|--------------------|------------------|
| A. Engineering | \$ 89,000. |
| B. Glass | \$ 23,200. |
| C. Purchases | \$ 25,000. |
| D. Fabrication | \$ 75,000. |
| E. Sub contract | \$ 25,000. |
| F. Quality Control | \$ 9,500. |
| G. Travel | <u>\$ 3,000.</u> |

\$ 249,700.

3. Cost Estimate for Spare Parts
(including windows)

| | | |
|---------------------------|---------------------------|----------------------|
| A. Engineering | \$ 7,898.00 | |
| B. Glass | \$ 50,000.00 | |
| C. Purchases | \$ 30,000.00 | |
| D. Fabrication | \$ 50,500.00 | |
| E. Quality Control | \$ 8,000.00 | |
| F. Travel | <u>\$ 3,000.00</u> | |
| | | \$ 149,398.00 |

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4. Estimated Costs for Flight Test Program

| Number of Systems to be Flight Tested | Duration of Flight Tests (at site) | Project Direction | Project Control | In-Plant Support | Flight Test Group at site | Travel & Field Adjustment | Instrumen- tation | Total Estimated Costs |
|--|---------------------------------------|----------------------|--------------------|---------------------|------------------------------|---------------------------------|----------------------|-----------------------------|
| Prototype only | 6 months | \$31,500. | \$54,910. | \$ 72,000. | \$ 98,000. | \$35,000. | \$50,000. | \$341,410. |
| Prototype and five additional systems | 13 months | \$38,000. | \$62,000. | \$156,000. | \$169,000. | \$63,000. | \$50,000. | \$538,000. |
| Prototype and nine additional systems | 17 months | \$41,000. | \$70,947. | \$204,000. | \$221,000. | \$84,000. | \$50,000. | \$670,947. |

Approved For Release 2009/09/21 : CIA-RDP67B00657R000200050001-0

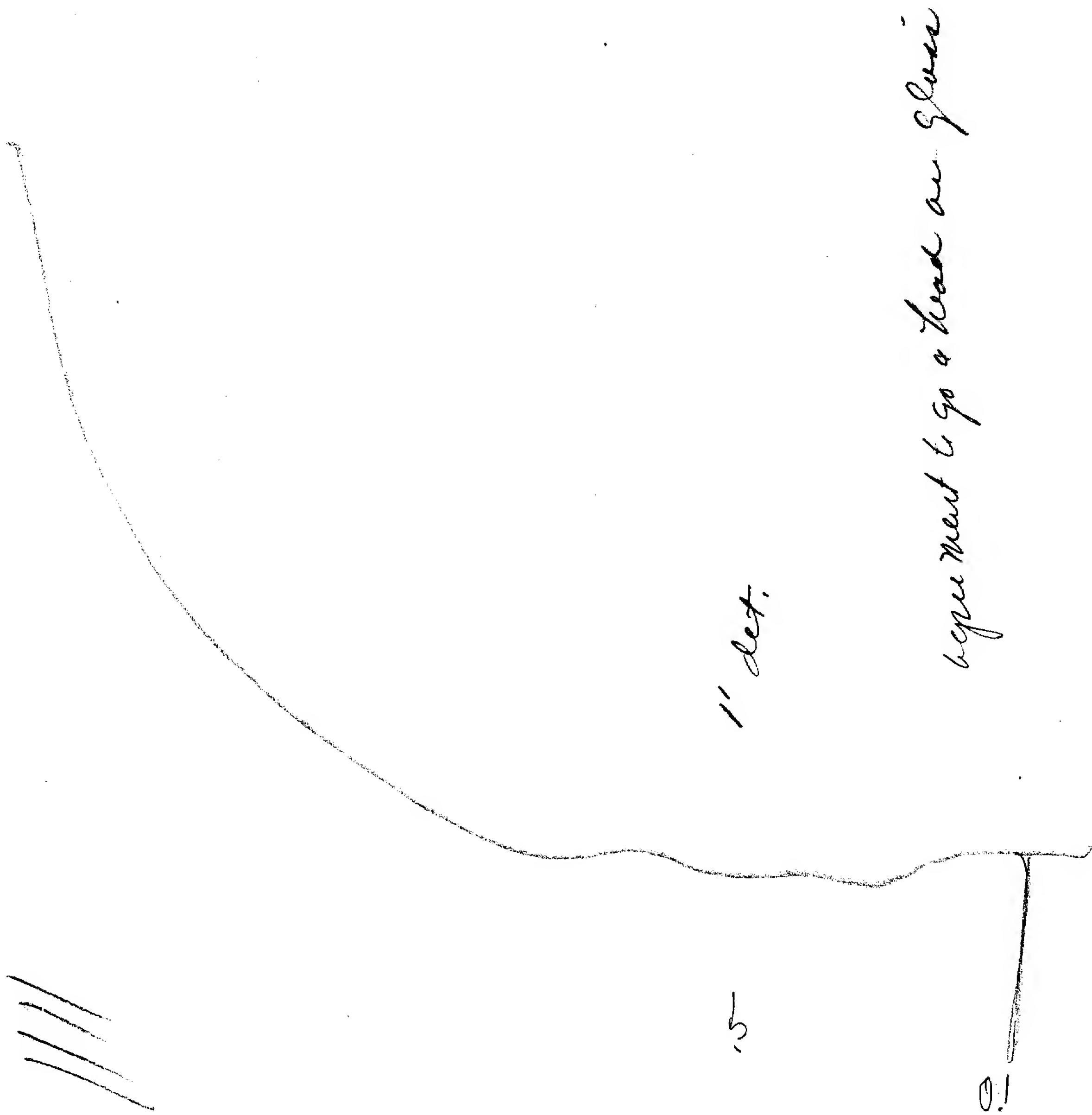
5. Estimated Costs for Five Additional Systems**Systems Hardware**

| | | | |
|-----------------------------|-------------------|----------------------|------------------------|
| A. Project Direction | | \$ 30,614.00 | |
| B. Project Control | | \$ 56,476.00 | |
| C. Engineering | | \$ 261,000.00 | |
| D. Reliability | | \$ 27,800.00 | |
| E. Glass | | | |
| Material | \$ 84,000. | | |
| Fabrication | \$ 90,000. | | |
| Tooling | \$ 10,000. | | |
| Quality Control | <u>\$ 6,000.</u> | | |
| | | \$ 190,000.00 | |
| F. Windows | | | |
| Material | \$ 145,000. | | |
| Fabrication | \$ 80,000. | | |
| Quality Control | \$ 5,000. | | |
| Travel | <u>\$ 5,000.</u> | | |
| | | \$ 233,000.00 | |
| G. Purchases | | \$ 300,000.00 | |
| H. Metal | | | |
| Material | \$ 5,000. | | |
| Fabrication | \$ 410,000. | | |
| Tooling | \$ 30,000. | | |
| Quality Control | <u>\$ 41,000.</u> | | |
| | | \$ 486,000.00 | |
| I. Travel | | \$ 25,000.00 | |
| | | <u></u> | \$ 1,610,390.00 |

6. Estimated Costs for Nine Additional Systems

Systems Hardware

| | | |
|----------------------|-------------------|---------------------|
| A. Project Direction | | \$ 48,721.00 |
| B. Project Control | | \$ 84,639.00 |
| C. Engineering | | \$ 470,000.00 |
| D. Reliability | | \$ 50,000.00 |
| E. Glass | | |
| Material | \$ 150,000. | |
| Fabrication | \$ 160,000. | |
| Tooling | \$ 10,000. | |
| Quality Control | <u>\$ 11,000.</u> | |
| | | \$ 331,000.00 |
| F. Windows | | |
| Material | \$ 260,000. | |
| Fabrication | \$ 140,000. | |
| Quality Control | \$ 9,000. | |
| Travel | \$ 5,000. | |
| | | \$ 414,000.00 |
| G. Purchases | | \$ 540,000.00 |
| H. Metal | | |
| Material | \$ 9,000. | |
| Fabrication | \$ 740,000. | |
| Tooling | \$ 30,000. | |
| Quality Control | \$ 74,000. | |
| | | \$ 853,000.00 |
| I. Travel | | <u>\$ 45,000.00</u> |
| | | \$ 2,836,360.00 |



SCHEDULE "A"

SUMMARY OF PRIME COSTS

| | Engineer'g | Admin. | Plant Service | Quality Control | Raw Glass | Material | Purchase Items | Fabr. | Sub Contract | Travel | Tooling | Total |
|-------------------------|-------------|------------|------------------|--------------------|--------------|----------|-------------------|------------|-----------------|---------|---------|-------------|
| Project Direction | \$ 110,817. | | | | | | | | | | | \$ 110,817. |
| Project Control | | \$ 88,158. | \$ 60,321. | | | | \$ 43,683. | | | | | 192,162. |
| Engr'g & Development | 1,089,000. | | | | | | 100,000. | \$ 60,000. | | 40,000. | | 1,289,000. |
| Reliability | 130,000. | | | | | | | 119,000. | | 3,000. | | 462,000. |
| System Hardware | | | | \$ 16,300. | \$ 29,000. | 6,000. | 60,000. | 88,000. | 90,000. | 8,000. | 97,000. | 394,300. |
| Windows | 160,000. | | | 1,200. | 57,000. | | | 34,000. | 15,000. | 7,000. | 10,000. | 284,200. |
| | | | | | | | | | | | | 30,614. |
| Project Direction | 30,614. | | | | | | 12,934. | | | | | 56,976. |
| Project Control | | 26,152. | 17,890. | | | | | | | | | |
| Engr'g & Development | 27,800. | | | | | | | | | | | 27,800. |
| Reliability | 261,000. | | | 47,000. | 84,000. | 5,000. | 300,000. | 500,000. | | 25,000. | 40,000. | 1,262,000. |
| System Hardware | | | | 5,000. | 145,000. | | | 80,000. | | 3,000. | | 233,000. |
| Windows | | | | | | | | | | | | |
| | | | | | | | | | | | | 48,721. |
| Project Direction | 48,721. | | | | | | 19,240. | | | | | 84,639. |
| Project Control | | 38,831. | 26,568. | | | | | | | | | |
| Engr'g & Development | | | | | | | | | | | | 50,000. |
| Reliability | 50,000. | | | | | | | | | | | 2,239,000. |
| System Hardware | 470,000. | | | 85,000. | 150,000. | 9,000. | 540,000. | 900,000. | | 45,000. | 40,000. | 2,239,000. |
| Windows | | | | 9,000. | 260,000. | | | 140,000. | | 5,000. | | 414,000. |
| | | | | | | | | | | | | |
| Field Support Equipment | 89,000. | | | 9,500. | 23,200. | | 25,000. | 75,000. | 25,000. | 3,000. | | 249,700. |
| Spares | 7,898. | | | 8,000. | 50,000. | | 30,000. | 50,500. | | 3,000. | | 149,398. |
| | | | | | | | | | | | | |
| Flight Test For (1) | 170,000. | | | | | | 62,465. | | | 35,000. | | 267,465. |
| Project Direction | 31,500. | | | | | | | | | | | 31,500. |
| Project Control | | 25,205. | 17,240. | | | | | | | | | 42,445. |
| | | | | | | | | | | | | |
| Flight Test For (6) | 325,000. | | | | | | 64,074. | | | 63,000. | | 452,074. |
| Project Direction | 38,000. | | | | | | | | | | | 38,000. |
| Project Control | | 28,458. | 19,460. | | | | | | | | | 47,926. |
| | | | | | | | | | | | | |
| Flight Test For (10) | 425,000. | | | | | | 66,127. | | | 84,000. | | 575,127. |
| Project Direction | 41,000. | | | | | | | | | | | 41,000. |
| Project Control | | 32,550. | 22,270. | | | | | | | | | 54,820. |

SUMMARY OF COST ESTIMATE

PRIME COST

1. Prototype Only

| | | |
|------------------------------|-----------------|-----------------|
| Prototype----- | \$ 2,732,479.00 | |
| Field Support Equipment----- | \$ 249,700.00 | |
| Spare Parts----- | \$ 149,398.00 | |
| Flight Test Program----- | \$ 341,410.00 | |
| | | \$ 3,472,987.00 |

2. Prototype and Five Additional Systems

| | | |
|------------------------------|-----------------|-----------------|
| Prototype----- | \$ 2,732,479.00 | |
| 5 Additional Systems----- | \$ 1,610,390.00 | |
| Field Support Equipment----- | \$ 249,700.00 | |
| Spare Parts----- | \$ 149,398.00 | |
| Flight Test Program----- | \$ 538,000.00 | |
| | | \$ 5,279,967.00 |

3. Prototype and Nine Additional Systems

| | | |
|------------------------------|-----------------|-----------------|
| Prototype----- | \$ 2,732,479.00 | |
| 9 Additional Systems----- | \$ 2,836,360.00 | |
| Field Support Equipment----- | \$ 249,700.00 | |
| Spare Parts----- | \$ 149,398.00 | |
| Flight Test Program----- | \$ 670,947.00 | |
| | | \$ 6,638,884.00 |

SUMMARY OF ESTIMATE

| | <u>Prototype Only</u> | <u>Prototype and Five Additional Systems</u> | <u>Prototype and Nine Additional Systems</u> |
|---------------------------------------|-----------------------|--|--|
| Prototype | \$2,732,479.00 | \$2,732,479.00 | \$2,732,479.00 |
| Field Support Equipment | \$ 249,700.00 | \$ 249,700.00 | \$ 249,700.00 |
| Spare Parts | \$ 149,398.00 | \$ 149,398.00 | \$ 149,398.00 |
| Flight Test Program | \$ 341,410.00 | \$ 538,000.00 | \$ 670,947.00 |
| Five Additional Systems | ----- | \$1,610,390.00 | ----- |
| Nine Additional Systems | ----- | ----- | <u>\$2,836,360.00</u> |
| Prime Costs | \$3,472,987.00 | \$5,279,967.00 | \$6,638,884.00 |
| General and Administrative | <u>\$ 694,597.00</u> | <u>\$1,055,993.00</u> | <u>\$1,327,777.00</u> |
| Total Estimated Cost | \$4,167,584.00 | \$6,335,960.00 | \$7,966,661.00 |
| Fixed Fee | <u>\$ 354,245.00</u> | <u>\$ 538,557.00</u> | <u>\$ 677,166.00</u> |
| Total Estimated Cost and Fixed Fee | \$4,521,829.00 | \$6,874,517.00 | \$8,643,827.00 |

* Costs contained in Attachment "A" are not included in this summary.

ATTACHMENT "A"

Capital Equipment Opt. Tooling Required for Optical Systems & Windows

Coating Equipment:

| | |
|--|-------------------|
| 1. Monitoring Equipment | \$ 6,000. |
| 2. Set of Narrow Band Interference Filters | 1,700. |
| 3. Mechanical System for Rotation Inside Bell Jar | \$ 4,000. |
| 4. 18" Bell Jars (Extras) | \$ 1,000. |
| 4. 18" Vacuum System | <u>\$ 10,000.</u> |
| | \$ 22,700. |

Grinding Equipment:

| | |
|--------------------------------|------------------|
| 1. Tilt Head Blanchard | \$ 18,000. |
| 2. Milling Mach. & Accessories | \$ 18,000. |
| 3. Large Sawing Mach. | \$ 14,000. |
| 4. Troyke Table | <u>\$ 3,600.</u> |
| | \$ 53,600. |

Polishing Equipment

| | |
|--|------------------|
| Rebuild Polishing Mach. Fabricate New Turntable | \$ 3,000. |
| (2) Loh Single Spindle Polishers | <u>\$ 3,200.</u> |
| | \$ 6,200. |

\$ 82,500.00

8% Handling & Installation \$ 6,600.00

\$ 89,100.00

Suggest this equipment be procured under contract RE-512